

Please replace paragraph [0033] with the following paragraph:

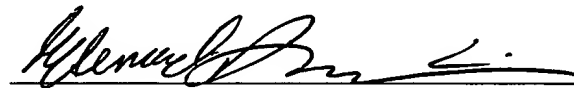
[0033] The concepts of the various embodiments of the branch-free methodologies described above are also applicable to other transcendental functions.

A3 One example is the computation of the function $\exp(X) - 1$ over a small range around its root, 0. In that case, an exemplary set of table values would correspond to $\exp(j \log 2 / 2^m)$ for some m . The reduced argument of the approximate function in this case would have the form $X - (j \log 2) / 2^m$.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: September 26, 2001

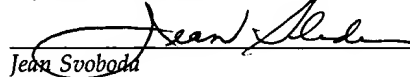


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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on September 26, 2001.



Jean Svoboda

VERSION WITH MARKINGS TO SHOW CHANGES MADE**IN THE SPECIFICATION**

Paragraph [0023] has been amended as follows:

[0023] To insure highest precision in approximating the function of X , the occurrence of roundoff errors should be minimized as much as possible. This may be accomplished by splitting each term of the approximate function into a pair of working-precision components whose sum is the value of that term. For the general base logarithm example given above, the value of $\log_b(2)$ is stored as a pair of working-precision numbers L_{hi} and L_{lo} , and the values of $\log_b(1/B_j)$ are stored in pairs of $T_{j,hi}$ and $T_{j,lo}$. For the example given here, precision is improved if $k L_{hi} + T_{j,hi}$ is representable exactly, that is without any roundoff errors, for all valid values of k and j . Consistent with $B_j = 0$, precision is also improved if $T_{0,hi} = T_{0,lo} = 0$. Also, consistent with $B_N = 1/2$, precision is further improved if $T_{N,hi} = L_{hi}$ and $[T_{N,lo} = L_{lo}]T_{N,lo} = L_{lo}$. Finally, there can be a further improvement in precision if C , which approximates $\log_b e$, is represented so that $Z = C(YB_j - 1)$ is computed without roundoff error when $j = 0$ or $j = N$.

Paragraph [0031] has been amended as follows:

[0031] Table Value Calculations: The leading parts of the table values are all obtained by rounding the ideal values to a precision such that the least significant bit is 2^{-43} . Hence, $[L_{hi} = \log_e 2]L_{hi} = \log_{10} 2$ rounded to lsb at 2^{-43} , and $[T_{j,hi} = \log_b]T_{j,hi} = \log_{10}(1/B_j)$ is similarly rounded. The trailing parts are simply the working-precision

approximation of the differences between the ideal values and the leading values.

Hence $[L_{10} = \log_e 2 - L_{hi}] L_{10} = \log_{10} 2 - L_{hi}$ rounded to 53 significant bits, and $[T_{j,lo} = \log_e] T_{j,lo} = \log_{10} (1/B_j) - T_{j,hi}$ rounded to 53 significant bits.

Paragraph [0033] has been amended as follows:

[0033] The concepts of the various embodiments of the branch-free methodologies described above are also applicable to other transcendental functions. One example is the computation of the function $\exp(X) - 1$ over a small range around its root, 0. In that case, an exemplary set of table values would correspond to $[\exp(j/2^m)] \exp(j \log 2 / 2^m)$ for some m . The reduced argument of the approximate function in this case would have the form $X - (j \log 2) / 2^m$.